

1. A method to form a transistor gate in the manufacture of an integrated circuit device, said method comprising:
 - providing a substrate;
 - forming a conductor layer overlying said substrate
 - 5 with a dielectric layer therebetween;
 - forming a masking layer overlying said conductor layer;
 - forming a resist layer overlying said masking layer;
 - patterning said resist layer to thereby selectively
 - 10 expose said masking layer wherein said resist layer exhibits a first spacing between edges of said resist layer;
 - etching through said exposed masking layer to thereby selectively expose said conductor layer wherein etched
 - 15 edges of said masking layer are tapered such that said masking layer exhibits a second spacing between said masking layer edges at the top surface of said conductor layer and wherein said second spacing is less than said first spacing; and
 - 20 etching through said exposed conductor layer to thereby complete a transistor gate.
2. The method according to Claim 1 wherein said conductor layer comprises polysilicon.

3. The method according to Claim 1 wherein said masking layer comprises silicon nitride.

4. The method according to Claim 1 wherein said step of etching through said exposed masking layer comprises a dry etch further comprising an etching chemistry of CFH_3 , CF_4 , O_2 , and He.

5. The method according to Claim 1 wherein the angle of the edges of said masking layer with respect to the top surface of said substrate is between about 45° and about 85° .

6. The method according to Claim 1 wherein said masking layer comprises a thickness of between about 600 Å and about 4,000 Å.

7. The method according to Claim 1 further comprising forming an isolation region in said substrate wherein said masking layer etched edges overlie said isolation region.

8. The method according to Claim 1 wherein said transistor gate is a floating gate of a non-volatile memory device.

9. The method according to Claim 8 further comprising:

forming a control gate overlying said floating gate
wherein said control gate comprises a second conductor
layer overlying a second dielectric layer; and

5 forming source and drain regions in said substrate.

10. A method to form a floating gate of a non-volatile
device in the manufacture of an integrated circuit device,
said method comprising:

providing a substrate;

5 forming an isolation region in said substrate

forming a conductor layer overlying said substrate
with a dielectric layer therebetween;

forming a masking layer overlying said conductor
layer;

10 forming a resist layer overlying said masking layer;

patterning said resist layer to thereby selectively
expose said masking layer wherein said resist layer
exhibits a first spacing between edges of said resist
layer;

15 etching through said exposed masking layer to thereby
selectively expose said conductor layer wherein etched
edges of said masking layer are tapered such that said

masking layer exhibits a second spacing between said
masking layer edges at the top surface of said conductor
20 layer and wherein said second spacing is less than said
first spacing and wherein said masking layer etched edges
overlie said isolation region; and

etching through said exposed conductor layer to
thereby complete a floating gate of a non-volatile memory
25 device.

11.The method according to Claim 10 wherein said conductor
layer comprises polysilicon.

12.The method according to Claim 10 wherein said masking
layer comprises silicon nitride.

13.The method according to Claim 10 wherein said step of
etching through said exposed masking layer comprises a dry
etch further comprising an etching chemistry of CFH_3 , CF_4 ,
 O_2 , and He.

14.The method according to Claim 10 wherein the angle of
the edges of said masking layer with respect to the top
surface of said substrate is between about 45° and about
 85° .

15. The method according to Claim 10 wherein said masking layer comprises a thickness of between about 600 Å and about 4,000 Å.

16. The method according to Claim 10 further comprising:

forming a control gate overlying said floating gate wherein said control gate comprises a second conductor layer overlying a second dielectric layer; and

5 forming source and drain regions in said substrate.

17. A method to form a non-volatile device in the manufacture of an integrated circuit device, said method comprising:

providing a substrate;

5 forming a shallow trench isolation in said substrate

forming a polysilicon layer overlying said substrate with a dielectric layer therebetween;

forming a masking layer overlying said polysilicon layer;

10 forming a resist layer overlying said masking layer;

patterning said resist layer to thereby selectively expose said masking layer wherein said resist layer

TS-03-373

exhibits a first spacing between edges of said resist layer;

15 etching through said exposed masking layer to thereby selectively expose said polysilicon layer wherein etched edges of said masking layer are tapered such that said masking layer exhibits a second spacing between said masking layer edges at the top surface of said polysilicon layer and wherein said second spacing is less than said
20 first spacing and wherein said masking layer etched edges overlie said isolation region;

 etching through said exposed polysilicon layer to thereby complete a floating gate;

25 forming a control gate overlying said floating gate wherein said control gate comprises a second conductor layer overlying a second dielectric layer; and

 forming source and drain regions in said substrate to complete a nonvolatile device.

18. The method according to Claim 17 wherein said step of etching through said exposed masking layer comprises a dry etch further comprising an etching chemistry of CFH_3 , CF_4 , O_2 , and He.

19. The method according to Claim 17 wherein the angle of

TS-03-373

the edges of said masking layer with respect to the top surface of said substrate is between about 45° and about 85°.

20. The method according to Claim 17 wherein said masking layer comprises a thickness of between about 600 Å and about 4,000 Å.